

# Space News Roundup

Vol. 20 No. 4

February 13, 1981

National Aeronautics and Space Administration

## Engines fire on pad next week

T-0 for the Flight Readiness Firing at the Cape next week is planned to occur at the opening of the launch window, which is approximately five hours in duration.

As for the STS-1 launch, the window will open at sunrise plus 45 minutes. The Flight Readiness Firing as of press time is scheduled for no earlier than Feb. 17, and window opening time for that date is 6:43 a.m. CST.

The FRF pre-count will be picked up at T-53 hours with the powering up of the solid rocket boosters, orbiter, and ground support equipment. The STS-1 launch

pre-countdown begins at T-68 hours. However, for the FRF, a number of events which would normally occur between T-68 hours and T-53 hours (such as loading hypergolic propellants for the auxiliary power units and the boosters' hydraulic power units) will have already been accomplished as a part of earlier tests.

In the timeline, the three engines are not ignited simultaneously, but start commands are issued at intervals of about 120 milliseconds. Start command for Engine No. 3 is issued at T-3.8 seconds, for Engine No. 2 at T-3.68 seconds, and

for engine No. 1 at T-3.56 seconds. The engines are throttled at 100% at approximately T-0.

Part way through the burn, the engines are throttled back to 94% of rated thrust. Near the burn's end, they are throttled up to 100% of rated thrust. The engine nozzles gimbal during both peak and reduced thrust.

The Wet Countdown Demonstration Test/Flight Readiness Firing will end when all propellants and cryogenics have been removed from the vehicle after engine firing.

See ENGINE FIRING.

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Go for launch

## Launch target slips to April

NASA has scheduled the Flight Readiness Firing of the Space Shuttle Columbia's main engines for Feb. 17 and estimates the launch of the Columbia will be no earlier than the week of April 5.

The schedules were set following a test readiness review in preparation for the FRF. The review was completed Jan. 30.

The change of several days in the firing schedule is required to accommodate a number of minor problems encountered during this first-time integration of the shuttle with ground launch systems.

During propellant tanking tests last month, two areas of insulation on the external tank, one approximately seven by eight feet and the other about four by four feet, became debonded.

This debonding will not affect the Feb. 17 FRF. The insulation will be rebonded before launch, after the readiness firing.

A preliminary estimate of the time required for the repair indicates that the launch date will be no earlier than the week of April 5.

### FRF TIMELINE

#### T-53 hours

Start of FRF call to stations.

#### T-11 hours

Extend fixed service structure external tank gaseous oxygen vent arm/start retraction of rotating service structure.

#### T-9 hours, 30 minutes

Retract external tank intertank access arm on fixed service structure.

#### T-5 hours, 30 minutes

Clear launch pad to begin countdown.

#### T-5 hours

Start countdown. Chilldown liquid oxygen/liquid hydrogen transfer system.

#### T-4 hours, 30 minutes

Begin liquid hydrogen fill of external tank.

#### T-2 hours, 4 minutes

One-hour built-in hold. ET cryo loading complete. Start ET prepressurization tests. No activities planned. (During STS-1 countdown, crew entry will begin following this hold and be completed by T-1 hour, 5 minutes.)

#### T-1 hour, 50 minutes

External tank ice/frost evaluation.

#### T-20 minutes

20 minute built-in hold.

#### T-9 minutes

Ten minute built-in hold.

#### T-9 minutes

Go for launch/start launch processing system ground launch sequencer (automatic sequence).

#### T-7 minutes

Start crew access arm retraction (fixed service structure).

#### T-5 minutes

Start orbiter auxiliary power units.

#### T-3 minutes, 45 seconds

Run orbiter aero surfaces profile.

#### T-3 minutes, 30 seconds

Orbiter placed on internal power.

#### T-3 minutes, 10 seconds

Run gimbal slew profile, space shuttle main engine.

#### T-2 minutes, 55 seconds

External tank oxygen to flight pressure.

#### T-2 minutes, 50 seconds

External tank gaseous oxygen vent arm retracted.

#### T-1 minute, 57 seconds

External tank hydrogen to flight pressure.

#### T-25 seconds

Solid rocket booster hydraulic power units activated/orbiter on-board general purpose computer

assumes control of terminal countdown/ground launch sequencer remains on line supporting.

#### T-18 seconds

Verify solid rocket booster nozzle position.

#### T-11 seconds

Initiate pre-liftoff sound suppression system water (post-liftoff system, "rainbirds," inhibited for FRF).

#### T-3.8 seconds

Main engine start sequence begins.

#### T+2.24 seconds

All engines at 90% thrust.

#### T+2.88 seconds

Simulated external tank umbilical retract/simulated solid rocket booster ignition and holddown post release.

#### T+3 seconds

Simulated liftoff.

#### T+18.2 to 20 seconds

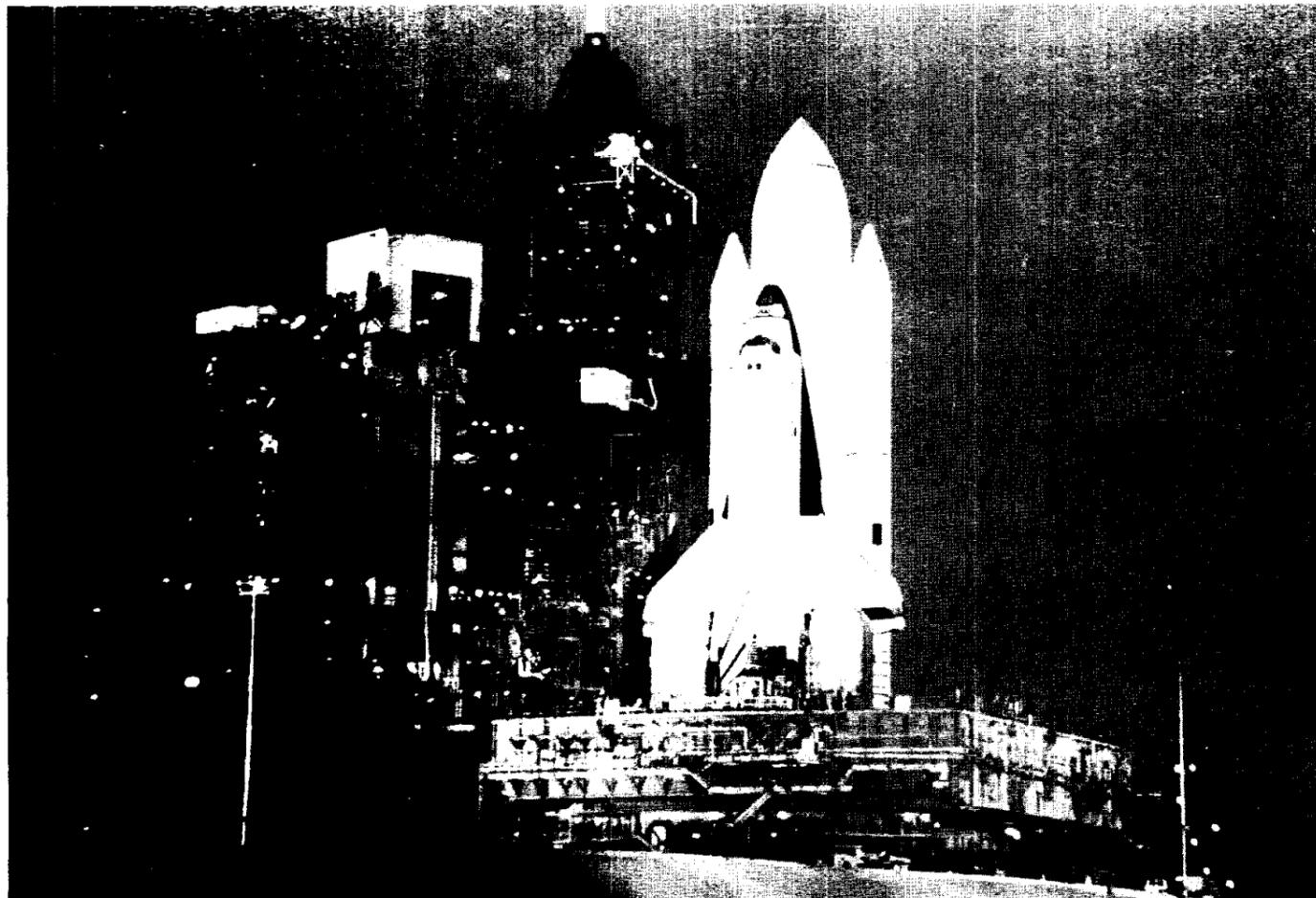
Main engine shutdown commands issued.

#### T+22 seconds

Solid rocket booster hydraulic power units shut down.

#### T+22.7 to 25.9 seconds

Main engine LOX/LH<sub>2</sub> prevalue closed.



On Pad 39A, the orbiter is going through final tests before launch

## 'We have every right to dream heroic dreams'

(Excerpts from President Reagan's Inaugural Address follow:)

We are a nation that has a government—not the other way around. And this makes us special among the nations of the Earth.

And—so there will be no misunderstanding—it's not my intention to do away with government. It is rather to make it work—work with us, not over us; to stand by our side, not ride on our back.

If we look for the answer as to why for so many years we achieved so much, prospered as no other people on Earth, it was because here in this land we unleashed the energy and individual genius of man to a greater extent than has ever been done before, through freedom and dignity of the individual.

It is time for us to realize that we are too great a nation to limit ourselves to small dreams. We're not, as some

See REAGAN SPEAKS, Page 4

# Cookin'

\*Menu subject to change without notice.

Week of February 16 - 20

- Monday:** HOLIDAY  
**Tuesday:** Celery Soup; Fried Shrimp; Turkey a la King; Pork Chop w/Applesauce; Chinese Pepper Steak (Special); Au Gratin Potatoes; Breaded Squash; Buttered Spinach.  
**Wednesday:** Seafood Gumbo; Fried Catfish w/Hush Puppies; Braised Beef Ribs; Mexican Dinner (Special); Spanish Rice; Ranch Beans; Buttered Peas  
**Thursday:** Green Split Pea Soup; Corned Beef w/Cabbage & New Potatoes; Chicken & dumplings; Tamales w/Chili; Hamburger Steak w/Onion Gravy (Special); Navy Beans; Buttered Cabbage; Green Beans  
**Friday:** Seafood Gumbo; Deviled Crabs; Broiled Halibut; Liver & Onions; BBQ Link (Special); Buttered Corn; Green Beans; New Potatoes.

Week of February 23 - 27

- Monday:** French Onion Soup; BBQ Sliced Beef; Parmesan Steak; Spare Rib w/Kraut; Chili & Macaroni (Special); Ranch Style Beans; English Peas; Mustard Greens. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.  
**Tuesday:** Split Pea Soup; Meatballs & Spaghetti; Liver & Onions; Baked Ham w/Sauce; Corned Beef Hash (Special); Buttered Cabbage; Cream Style Corn; Whipped Potatoes.  
**Wednesday:** Seafood Gumbo; Cheese Enchiladas; Roast Pork w/Dressing; BBQ Link (Special); Pinto Beans; Spanish Rice; Turnip Greens.  
**Thursday:** Beef & Barley Soup; Roast Beef w/Dressing; Fried Perch; Lasagne w/Meat; Chopped Sirloin; Chicken Fried Steak (Special); Whipped Potatoes; Peas & Carrots; Buttered Squash.  
**Friday:** Seafood Gumbo; Fried Shrimp; Baked Fish; Beef Stroganoff; Fried Chicken (Special); Okra & Tomatoes; Buttered Broccoli; Carrots in Cream Sauce.

## Bulletin Board

From Page 3

by Sain-Saens, and "Concerto Grosso" by Vaughan Williams will be performed by the UH/CLC Community Orchestra conducted by Charles Johnson. The concert begins at 8 p.m. Feb. 21 in the Auditorium of the Bayou Building on campus at 2700 Bay Area Blvd. Tickets are \$2 for adults, \$1 for students and senior citizens.

### STS-1 Team T-Shirts on sale in CF7

Not available in Bonwitt Teller's or Ward's, an "STS 1 Team" t-shirt, in beige with a color emblem of the STS-1 mission patch, is on sale in Building Four. Sen. Batson D. Belfry (Ind.-College Station) says even if you already have "a mug and a cup and a decal and a patch that ain't (sic) enough. You put on a t-shirt and the public takes note." Place your order early by calling Larry Strimple or Sandy Mangold at x3421. Cost is \$4.50 including tax, shipping, and entertainment.

### Big Values on sale at the JSC Exchange Store

(Store hours 10 a.m. to 2 p.m.)  
 Plitt Theatre tickets: \$2.10  
 General Cinema tickets: \$2.40  
 Postage stamps: \$3/book  
 Entertainment '81 Coupon Book: \$16  
 Gold C Values Book 80-81: \$5

### Budding photographers, take note of this contest

Now is the time to enter the 1981 HGAI RC Photo Contest. Contest categories are color prints, color slides, and black & white prints. You may enter up to four entries in each category. Cost is \$1 per category. Up to \$200 in prize money will be awarded. Deadline for entries is March 6. Call Carl McCollum at 483-3594 for more details.

# Long hours, hard work, expertise, leadership, and ingenuity earn JSC honorees view of launch

Late last year, NASA announced it was taking nominations for the Space Shuttle Launch Honoree Program for selected personnel who have done outstanding work on the Space Transportation System. Those awarded will go to Kennedy Space Center three days before the first shuttle mission, take part in a number of special events, and have the opportunity to view the first shuttle launch.

The honorees have been selected, and they are listed below.

**Anne L. Accola** is a Simulator Supervisor in the Flight Training Branch. She leads a team of eight instructors and is considered to be an expert in all areas of flight operations training.

Accola developed the first Shuttle Flight Operations Manual on flight software during ALT, a document which became the prototype for software volumes of the SFOM for the first missions.

As one of the early simulator team leaders, she developed concepts and techniques which have become the cornerstone of the flight crew/flight controller training program.

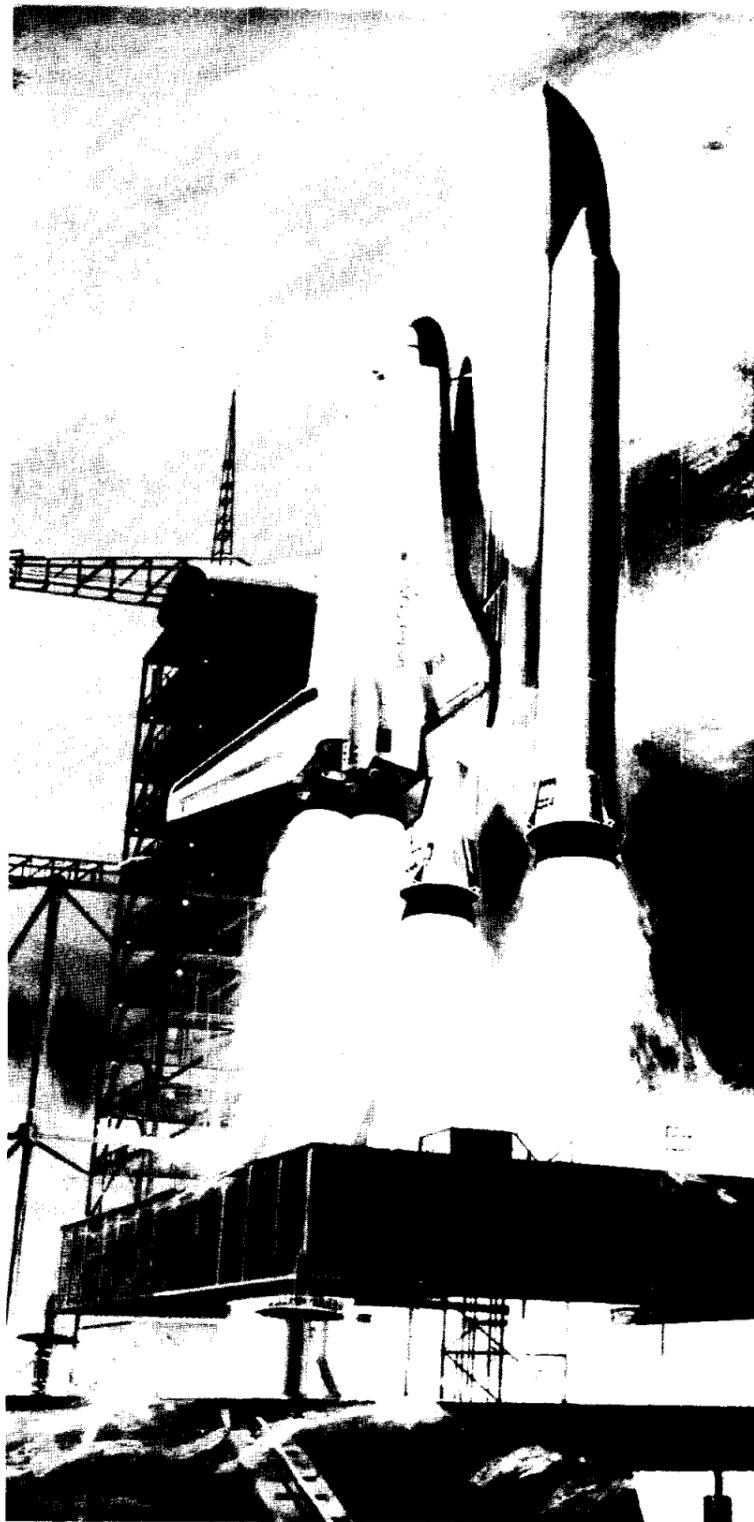
**Walter S. Ankney** is a data analyst in the Spacecraft Software Division. He is responsible for design, development, and verification of the systems software for the shuttle primary avionics software and as such has made significant contributions to the STS-1 mission.

Ankney's initiative in understanding and questioning anomalies early in the program led directly to the resolution of numerous problems, and his work in maintenance and verification have resulted in the high degree of readiness today of the software for flight.

He is considered to be the NASA expert in the area of systems software by both the developers and the users of flight software.

**Claudette A. Gage** is an occupational health nurse in the Flight Medicine Clinic. She serves as staff nurse in the Astronaut Clinic and is responsible for maintaining pilot and dependent medical records and assisting the NASA flight surgeons with examinations and clinical care.

**Edward P. Gammon**, of the Program Operations Office, develops, implements, and maintains calibration data allowing information to be converted from



telemetered and recorded data into useful engineering information which is used in statusing all shuttle subsystem performance.

Gammon has demonstrated a unique ability to accomplish this task. The various shuttle data systems require nine different and distinct data flow systems. Gammon's organizational talent and management ability have been applied to the design of systems which allow rapid data exchange even though three or four organizations are involved in each of these data flow systems.

Gammon has demonstrated outstanding leadership in both acquiring the initial data and in rapidly supplying updates due to hardware and software changes.

**Eleanor L. Johnson** is a clerical assistant in the Space Shuttle Program Office. She has continually demonstrated superior capability in her role as secretary and clerical assistant and has contributed to the overall efficiency and effectiveness of two offices.

Johnson is an administrative assistant to both the Manager of the Management Systems Office and the Deputy Manager for Management Integration of the space shuttle program.

**Amelia L. Moody** is a secretary in the Test and Ground Operations Office, and as such she assists technical personnel in the format of various documents as well as performing general clerical duties.

Moody has continually demonstrated an outstanding capability to handle difficult assignments. She receives information from other NASA centers and contractors and disseminates the information to the appropriate office technical manager in a professional and responsible manner.

She also finalizes formal presentations for all levels of NASA management and works with senior NASA and Air Force personnel to assure the timely exchange of technical information.

**Linus P. Murray**, of the Structures and Mechanics Division, is responsible for project engineering and direction of all test programs conducted to evaluate and verify the performance of the thermal protection system on the orbiter vehicle.

Murray has been project engineer for hundreds of tests of the orbiter thermal protection system materials. He has coordinated the work of 27 contractor engineers and technicians on both day and night shifts. In essence,

he's been doing the work of at least two well-qualified engineers, and he's been on call 24 hours a day.

Several of the test programs defined the degree of damage the TPS materials can sustain without jeopardizing mission success. They directly influenced TPS modifications to assure success.

**Charles W. Ragan** is a mechanical engineer technician in the Technical Services Division Machine Branch. As project leader, he assists scientific and technical personnel in design, development, and testing of experimental components and prototypes used in aerospace research and development.

Ragan was the leader on the project for manufacture of 10 Shuttle Oxygen Pressurant Flow Control Valves, a project which was critical to support of the STS-1 mission.

Working only with verbal instructions, Ragan set the priorities for eight other individuals on his team and worked many machines simultaneously.

The flow control valves were fabricated and released on time through Ragan's devotion to duty and expertise.

**William W. Seibert** is the lead project engineer on the Orbiter S-band network equipment as well as project engineer on the development of the S-band Payload Interrogator.

Seibert has made valuable contributions to the orbiter's communications and tracking system. His assignments began in the area of secure communication planning.

In his two current assignments, Seibert has given, without reservation, his time and attention to myriad details involved in development of this orbiter hardware.

**Donald R. Visness** is a senior electrical engineer at the White Sands Test Facility in the Technical Support Office. He is responsible for the fire alarm system, closed circuit television, and all test article electrical control systems in the 400 test areas at White Sands.

During the past two years, Visness has designed the modifications needed in the control system for the Vernier Reaction Control System Tests, the High Altitude Reaction Control System tests, and the Orbital Maneuvering System Qualification tests.

He has been at White Sands since 1964, and he has made significant contributions to both the Apollo and the Shuttle programs.

**David W. Yeary**, as a technical resource manager, plans and coordinates resources for the Lockheed Reusable Surface Insulation for the Orbiter Project.

Yeary's work has allowed the Orbiter Project Manager to incorporate meaningful RSI planning into the overall project plans, a job considered to be one of two or three most difficult technical tasks involved in shuttle development.

Yeary works in the Orbiter Project Control Contract Engineering Office.

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees.

Editor..... Kay Ebeling

# Bulletin Board

## JPL scientist to give Voyager presentation next AIAA meeting

Arden L. Albee, chief scientist at the NASA Jet Propulsion Lab will speak on "The Science of Space" at the monthly dinner meeting of the American Institute of Aeronautics and Astronautics Tuesday Feb. 17 at Gilruth Center. Albee will illustrate his speech with films from the Voyager encounter with Saturn. There will also be a guest speaker from AIAA for "Membership Night."

The program, which begins at 8:30, is open and free to the public. For those attending the dinner, social hour begins at 5:30 and the meal is served at 7. Reservations for dinner should be made by Feb. 13 by calling Sandra at 483-3995.

Albee has been associated with NASA since 1972 when he served on the Lunar Science Review Panel. He was a member of the Terrestrial Bodies Science Working Group in 1976-77, and the Mars '84 Science Working Group in 1977-78, while serving on numerous other bodies.

Albee has been chief scientist at JPL since 1978.

## Mission Control team leader to speak at L-5 meeting Feb. 20

"Final Countdown to a New

## Black History program set in Building Two Feb. 17

In observance of National Black History Month, JSC will present a program commemorating the 55th annual recognition of the contributions black Americans have made to American life and culture.

The idea for black history observances was initiated in 1926 by Dr. Carter G. Woodson and has now been adopted nationwide during the month of February.

This year's program will be held in the Building Two Auditorium Feb. 17, from 1:30 to 3:30 p.m., with a theme, "Space: Direction for the '80s and '90s."

Individuals involved in the space program at various NASA centers will take part in a panel



discussion with involvement of the JSC audience.

Several students of the Delta Sigma Theta Youth Group recently competed in an art and essay contest, and the winners will be announced and receive awards during the Feb. 17 program.

All JSC and contractor employees, as well as other members of the community, are invited to attend.

Era" is the title of a presentation to be made by Jim Clawson, manager of Rockwell's Thermal Control division, at the L-5 monthly meeting Feb. 20. Clawson will discuss some of the key problem areas—including launch, landing, and the complex problems of maintaining thermal and environmental control in space, and he will answer questions on the coming Orbital Flight Test Program as

well as other topics from the audience. The meeting is at 7 p.m. followed by the speaker at 8 in the Pacific Room of the University Center at the U of H Central Campus.

## "A Concert for Children of All Ages" plays Feb. 21 at Clear Lake campus

"Peter and the Wolf" by Prokofiev, "Carnival of the Animals" See BULLETIN Page 2

## At the Rec Center

The following classes are offered at the Gilruth Recreation Facility:

**Scuba Class-** A seven week Scuba Course begins March 10. The course, taught by the JSC Scuba Club, will include lectures on Tuesdays from 6:30-9 and indoor pool time on Thursdays from 7-9:30. The cost is \$75 per person and successful completion results in NAUI Certification.

**Advanced Country Western Dance-** Learn the latest in C & W dance steps as well as the old standbys. The course is designed for persons who have had some lessons. The class meets for six weeks, beginning Monday, March 9, and the

cost is \$18 per couple.

**Basic Auto Mechanics-** Learn to perform minor repairs and preventative maintenance on your car and save money at the same time. The course is strictly for beginners and meets on three Thursdays beginning March 26 from 7:30-9:30, and on one Saturday, April 4. The cost is \$16.75 per person.

**Defensive Driving-** Learn the art of safe driving and qualify for a 10% discount on your auto insurance. Class meets from 8 a.m.-5 p.m., March 21.

### Other Programs:

**Saturday at the Movies-**

Tickets are now on sale at the Building 11 Exchange Store for the next children's movie at the Gilruth Recreation Center. The feature presentation will be the Disney classic, "Lady and the Tramp." The program also includes cartoons, popcorn, and soda and the cost is \$1 per ticket for the Feb. 28 program. Showtime is 10 a.m.

**Mixed Volleyball League-** Register now for this Friday night social league which begins on Feb. 27. Cost is \$45 per EAA team and \$90 for non-EAA teams. Deadline is Feb. 21.

**Basketball Registration-** Sign up now for men's and women's basketball. Our second

## Your paycheck's not late it's been re-computerized

Recent changes in the timing of JSC employees' paychecks have raised questions around the center. An employee in Central Pricing offered this explanation for publication in Space News Roundup.

by Karl Beisel

In October of last year, JSC implemented certain changes in the mechanics of its electronic fund transfer which may have affected you more than you realize. This article explains what happened in theory and in practice (as they differ significantly).

### The Theoretical Change

The official payday was changed from alternate Mondays to Tuesdays, a one day change in theory. Many employees may have actually thought paydays were Fridays which was not true. So, we have a one day change in the day your pay is transferred to your account. This does not appear to be an alteration which would substantially affect anyone; however, it was not the practical change.

### The Actual Change

It is true that the official payday

was moved ahead only one day. But before you can understand the change, you must first understand how the system functioned in the "before time."

On the Wednesday before payday (remember, payday was the forthcoming Monday), the JSC Payroll Office sent a computer tab run by name and amount to the receiving organization (a bank).

The banks generally received this run on Thursday, sometimes on Friday. Most banks (including Nassau Bay National and the JSC credit union) then credited your account on Friday (remember the official payday is still the upcoming Monday).

Since your account was credited on Friday, you then could have gone to the bank that very day and cashed a check against your pay. Further, any check you wrote on Friday would be good (as levied against your pay) the forthcoming Monday.

When the official payday was changed to Tuesday, the situation described above was eliminated. Not only was the official payday changed but other changes were made as well.

The JSC Payroll Office no longer sends out a tab run to the banks (by mail) on the prior Wednesday. The banks now receive payroll information electronically on Tuesdays (your account is credited Tuesday).

Actually, before the change, the banks were mailed a composite check for all employees under the transfer to the banks. This is now done directly by computer to computer transfer.

Thus JSC employees have lost the use of their pay for four additional days.

You should be aware that your checks written to commercial organizations will no longer clear on Monday (as written against your pay).

Beisel in a JSC Price Analyst.

# Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

### Household Articles

GE 15 cu. ft. freezer, like new, \$200. Call 334-3027.

For Sale: 1/3 H.P. insinkerator disposal, 946-6296.

Built-in elect. oven, \$20; range top, \$30; dbl. sink/fix., \$20; vent hood, \$10; two built-in laboratories/fix., \$40. Jaap, 534-2415.

### Miscellaneous

Golf woods: 1,2,3,4 Hagen. Ideal for intermediate or beginner. 488-1410.

For Sale: original NASA "Meat Ball" LOGO tie pins and patches. 488-5522, x7474.

Astronomical Telescope, 700 MM-Wooden Tripod in case-2 lenses - 2 X Multiplier. 333-4470.

Set of CHILDCRAFT Ref books. Knight 488-3235.

Carved picture frames for 2 ft x4 ft canvas at a bargain. x4823.

Tourmaline mink and creme color leather combination for stroller. Worn only twice. Original price \$1099. Price \$400. x4381, 488-1256.

Sell or trade Spalding Golf Clubs, 3 woods, 8 irons, leather bag cart. \$125 Starter/youth set \$60. Barrow 488-1966.

Set of 4 dictation records \$10, upright freezer, 11cu. ft \$150, Royal electric typewriter \$50. Morton 946-4752.

Ski Boots- 5 Buckle Reiker size 10-1/2 \$20 pr. x4895.

### Musical Instruments

Must sell Amps 250 watt Kustom Bass \$450. Fender Super-Six \$600. Will talk package. Call Leon 483-2141.

### Wanted

Banjo picker to swap Bluegrass songs with. Marianne 486-4747.

Wanted Paper trimmer 12 inch minimum size. 488-5037.

### Boats & Planes

16 Prindle Catamaran, Racing Rig, Trailer with cat box, approx 2 yrs old. \$3,000. 721-5074.

### Carpools

Need to join Carpool (or ride) 8-4:30 Shift, Alameda Mall/Sagemont Area to Bldg. 16. Annie Patrick. x4281.

### Cycles

'79 Suzuki DS 100 dirt bike. Seldom ridden, never raced, \$399. Russ x5565 or 334-2894.

For Sale: Vespa Ciao Special Moped, excellent condition. \$400. Murtagh x3217.

### Cars & Trucks

For Sale: 66 Buick skylark, automatic transmission, power steering, brakes, Michelin radials, well maintained. 87,000 miles \$500. Phil x4801 or 333-2476 after 5.

1976 Pontiac Sunbird, auto, air sunroof, tilt steering, mag wheels, new SBR, AM/FM, 20-mpg, \$2750.00. x2217 John or 480-2015 after 4.

For Sale Cheap: 1972 Mustang front seats (Deluxe), rear seat covers (convertible), Four hubcaps & Wheel rims (Ford Motor Company). Two complete 72 Mustang Doors, ready for paint, other misc. parts. Mike x4326 482-9103 nites.

Must Sell: 1973 Grand Torino. 4-door, automatic, 4 brand new tires, 67,000 miles. \$850 Negotiable. Irma x2307/337-3021.

'79 Oldsmobile Cutlass Supreme Brougham, am/fm, ac, Landau top, ps, pb. Etc. Excellent condition, good gas mileage (small V-8). 486-4513.

Special Cabover: Fully contained, w/air, an exceptional buy, in good condition. 332-8011 or 554-6058 after 5:30.

For Sale: 1977 Cougar XR, air, power, am-fm stereo, loaded, 44,000 miles, like new. 488-7427, Thompson. x3394.

Wanted: 1970 Olds Delta 88 front bumper and head panel. Will pay \$25 ea. x4895.

'77 Chevy window van, yellow, 1/2 T, 350 V-8, 3sp., a/c a/m, cass., c.b., 2 capt. chrs, Wut. spk, mud tires, hvy. dty. suspen. sway bar \$2,250. 332-2813, 333-4291 Lee.

1978 Brougham 23' mini motor home. Sleeps 7, cruise, dash air, roof air, low miles. 479-6766 after 6.

## TAKE STEPS....



TO FIGHT RISING COSTS...

BY SENDING YOUR COST REDUCTION IDEA ON A JSC FORM TO BE!

Cartoon by Russ Bytner

Misc: Headers for 1970-80 Firebird. 32G-455 ci, in carton \$50, Thompson 332-2229.

'76 GMC 3/4 ton pick-up & camper. Excellent cond., self-contained, sleeps 6, \$4995. Phone 538-1403 after 5.

1980 Corvette, high performance options. \$13,500. 486-5522 x7474.

Convertible 1968 Chevy Impala SS 327, a/c pwr. windows, am. 488-1410.

Classic '66 Volvo with '73 engine. In excellent cond. 474-3716 after 5.

'75 Pinto - auto, a/c am/fm radio, hatchback, new tires, \$1000. Jeff x2651 or 334-5368.

### Pets

For Sale: One (1) meandering marsupial (bronze) looking for good home. Likes to travel. Call 555-3035.

### Property & Rentals

Lease: 2-2 fireplace, ceiling fan, new carpet, fridg, washer/dryer, convenient to NASA, no pets \$450 avail Feb 11. 334-7061 after 5.

Lease: 1 bedroom condo at Baywind I in Clear Lake City. No pets \$270 per month plus elec. \$200 deposit. Mason x5281 or 333-4144.

April Sound, 2 bedroom Condo-share. Available March 21. \$3500 or \$1400 equity and \$53.96 monthly. \$4350.00 value. 333-4396 or 483-3319.

For rent: Galveston By-the-Sea Condominium. Two bedroom furnished apartment for rent by day, week, or month. Clements 474-2622.

Rent to conscientious, non-smoker one bedroom with kitchen and laundry privileges. 6 mi. from NASA. \$160/mo. Call Jeff x7429 or 482-5393.

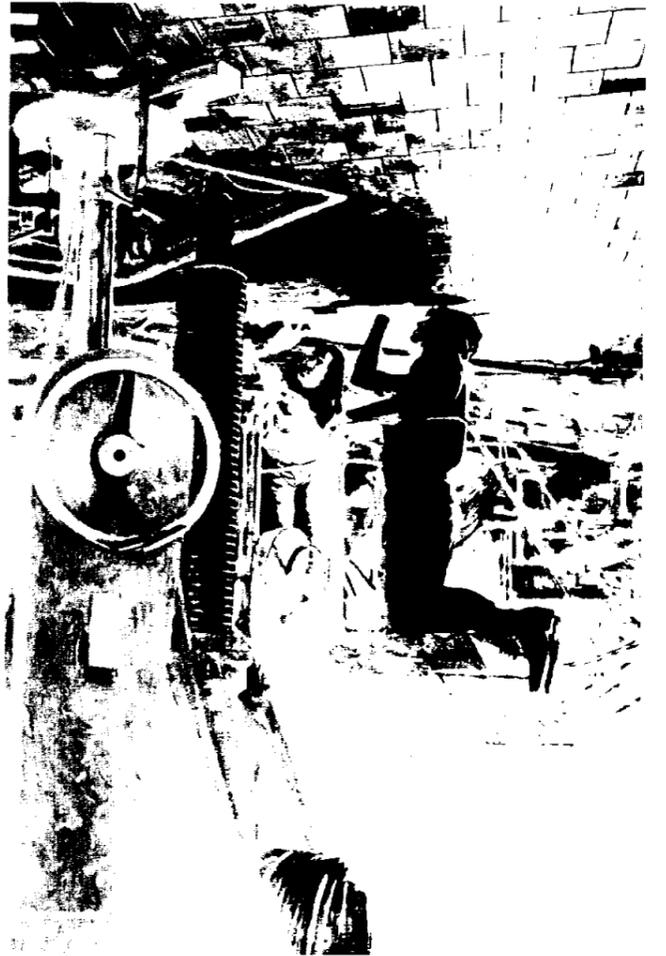
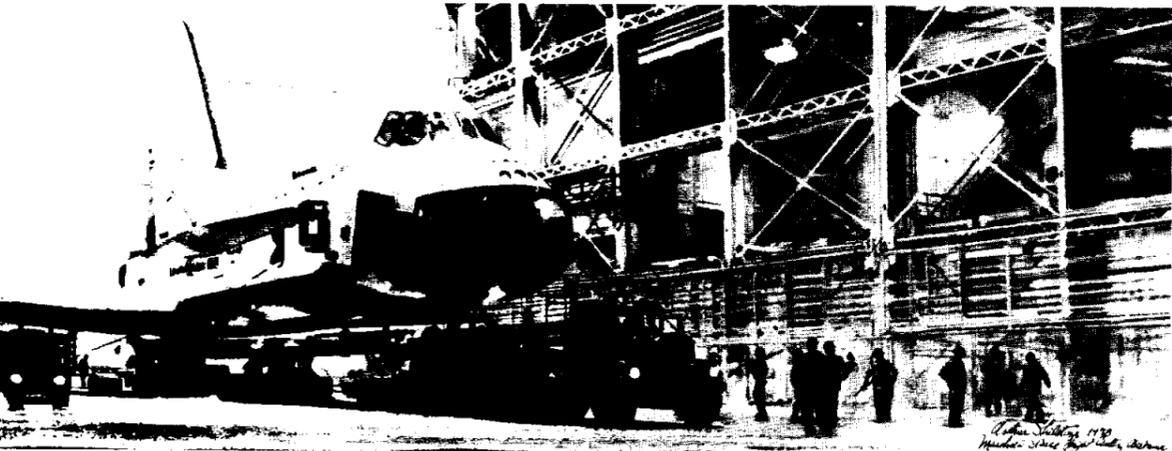
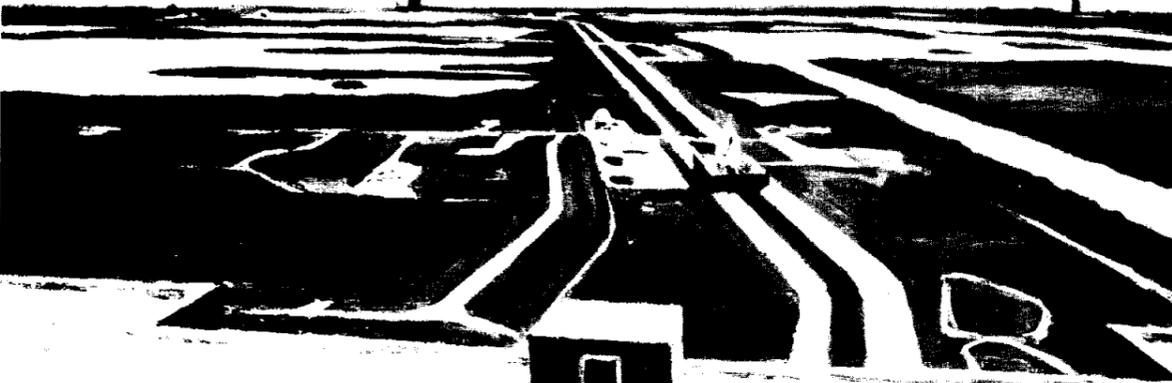
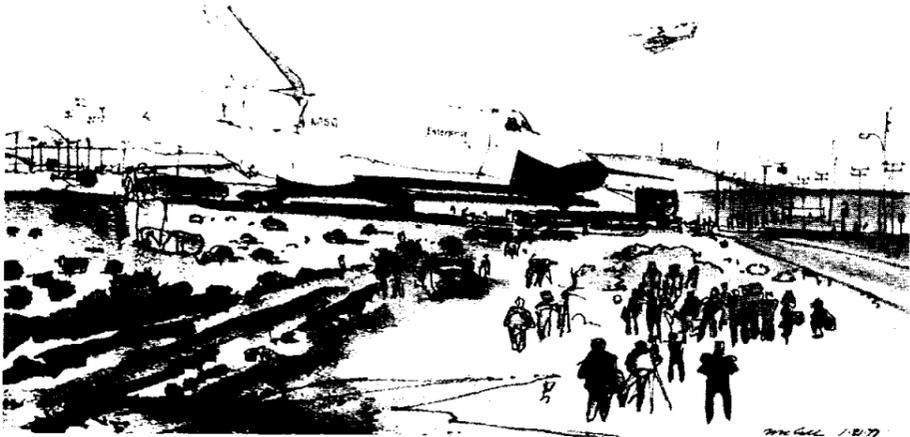
Rent: Clear Lake City: Condo. 2-2, refrig, w/d, fpl 6 mo. new, \$395 plus dep. 482-6609 after 4.

Rent: Lake Livingston retreat 3 b/r waterfront under the trees all amenities by the week or wk/nd. Jerry x4207 or 554-6093.

# NASA artists depict space shuttle from first tests to launch



Various stages of orbiter development are shown here as interpreted by artists in the NASA Arts Program. From top, counterclockwise, Bob McCall's painting of the Enterprise rollout; the move from Rockwell's assembly facility, again by Bob McCall; view of Enterprise from the VAB roof, oil painting by Nicholas Solovioff; Enterprise arrives at Marshall, water color by Arthur Shilstone; and the "Tile Team" at work at the Cape, oil painting by Morton Kunstler.



## World better place in 2000

Earlier this year, *Space News Roundup* solicited articles from employees on what they think will be taking place in the space program in the year 2000. The following is one response: we are still accepting articles at AP3.

by Joseph Gardner

(Gardner is an employee in the Mechanical Branch of the Facilities Design Division.)

Around the end of the '80s, NASA launches a new research program: fusion, and within the next 10 years a new revolution evolves. Fusion power has had a most remarkable influence upon life by the year 2000. Oil is no longer needed as a fuel because fusion plants generate all the power we could possibly need.

NASA has moved into Phase II of its Deep Probe program. We are now sending space ships out of our galaxy to explore deep space. Space ships traveling

at the speed of light are opening whole new worlds, and space travel is a pleasure now because fusion has given space vehicles steady state power to drive around the universe.

Once again, NASA's research has paid off. A fusion revolution has ushered in an age of limitless hydrogen fuel and with the technological spinoffs new companies and products are popping up on all sides.

Fusion has turned the chemistry industry upside down. By using high temperature fusion plasma, chemists can break down complex molecular structures and re-create new chemicals. It is now possible to create almost any material we need or want and get rid of anything we do not want.

There is no longer any pollution because all refuse or waste is converted into useful material. With the high degree of heat generated by fusion, all food and body parts are made chemically.

The world is a better place to live in the year 2000.

## Reagan speaks of new beginning

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would have us believe, doomed to an inevitable decline. I do not believe in a fate that will fall on us no matter what we do. I do believe in a fate that will fall on us if we do nothing.

So with all the creative energy at our command, let us begin an era of national renewal. Let us renew our determination, our courage, and our strength. And let us renew our faith and our hope.

We have every right to dream heroic dreams.

As we renew ourselves here in our own land, we will be seen as having

greater strength throughout the world. We will again be the exemplar of freedom and the beacon of hope for those who do not now have freedom.

The crisis we are facing today requires our best effort and our willingness to believe in ourselves and to believe in our capacity to perform great deeds; to believe that together we can and will resolve the problems which now confront us.

And after all, why shouldn't we believe that? We are Americans.

## Engine firing a final STS test

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The seventh and final 56-hour mission simulation will take place at JSC one week after the FRF. The Shuttle Mission Simulator in Building Five will be electronically linked to the Mission Control Center in Building 30, as in previous sims, to provide a realistic flight exercise

from solid rocket booster ignition and liftoff to a landing at the primary landing site at Dryden Flight Research Center in Edwards, Calif.

The simulated liftoff will occur at the opening of the launch window. This will be the final long-duration sim for the STS-1 flight crews.